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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,948	12/16/2003	Chih-Min Tseng	TS03-222	5533

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EXAMINER

MACARTHUR, SYLVIA

ART UNIT PAPER NUMBER

1763

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,948

Applicant(s)

TSENG ET AL.

Examiner

Sylvia R. MacArthur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/3/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 36 and 59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 36 and 59 contains the trademark/trade name SPS-200. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a dry film removing solution and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 24-30, 32-35, 38, 39, 41-45, 47-53, 55-57, 61, 62, and 64-67 are rejected under 35 U.S.C. 102(b) as being anticipated by Tseng et al (US 5,820,689).

Regarding claim 24: Tseng et al teaches a wet chemical treatment system and method for cleaning such.

The apparatus is inherently capable of removing dry film contaminants from a dry film solution, in that the apparatus comprises:

a means for first applying a dry film removal solution to a semiconductor wafer (inner tank 14) to remove a dry-film from the semiconductor wafer, said dry-film removal solution containing dry film;

a means for circulating said dry film removal solution (recirculating means 40);

a means for collecting said circulated dry film removal solution (outer tank 16),

a means for pre-filtering said dry film removal solution (filter means 50) , thereby removing said dry film from said collected dry film removal solution; and

a means for second applying a dry film removal solution to said at least one semiconductor wafer (inner tank 14).

Regarding claim 25: Tseng further teaches that said means for circulating said dry-film removal solution comprises providing means for circulating said dry-film removal solution from said first applying to said collecting to said pre-filtering to said second applying a dry film removal solution, further providing at least one fluid control valve with interconnecting tubing for flow of dry film removal solution there-through and at least one pump for propulsion of dry film removal solution there-through see Fig.5 element 92 (control valve) and col.2 lines 34-39 it is cited that a mechanical pump is used to transport the fluids.

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Regarding claim 26: Tseng et al further teaches means for pre-filtering being intermittently applied with time-period between successive applications, assuring that the me-filtering is not at all times part of a dry film removal circulation loop, note the liquid exiting the filter can be drained from 32, see col. 2 lines 21-30.

Regarding claim 27: Tseng et al further teaches that the by-products of the dry-film pre-filtering from the dry-film removal solution will be dissolved and returned to the solution (this occurs when 24,26 are inlets).

Regarding claim 28: The apparatus of Tseng et al is inherently capable of dissolving and returning to the solution of said by-products is dependent on the time of operation of the means for dry film pre-filtering. Note that this is a process limitation and does not introduce a structural limitation.

Regarding claim 29: The apparatus of Tseng et al teaches that the means for pre-filtering comprising valves (92 open 28 closed) and a pre-filter module (filter 50).

Regarding claim 30: The apparatus of Tseng et al wherein the valves and a pre-filter module comprising control capabilities such that said valves and pre-filter module can be adjusted as a function of the time of operation of the means for pre-filtering. The apparatus of Tseng et al is inherently capable of performing this function.

Regarding claim 32: The apparatus of Tseng et al, whereby by-products that are pre-filtered are not returned to the dry film removal solution, note the liquid exiting the filter can be drained from 32, see col. 2 lines 21-30.

Regarding claim 33: The apparatus of Tseng et al, further comprising means for circulation of the dry-film removal solution by closing a pre-filter valve 92 line 86 is used.

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Regarding claim 34: The apparatus of Tseng et al, whereby effectiveness of said means for pre-filtering is dependent on a Stripping Rate and Trapping Rate of the dry-film removal solution, this is inherent to the type of pre-filtering device used.

Regarding claim 35: The apparatus of Tseng et al, said means for pre-filtering preferably being applied for a period of between about 5 minutes and 15 minutes after initiation of said circulating of the dry-film removal solution, this is a process limitation and requires no structural limitation. The apparatus of Tseng et al is inherently capable of performing this step.

Regarding claim 38: The apparatus of Tseng et al wherein an optimum operational temperature is established with as objective of achieving an optimum Stripping Rate. This is an intended use limitation wherein the apparatus of Tseng et al is inherently capable of performing this function.

Regarding claim 39: The apparatus of claim 24, whereby said means for pre-filtering is preferably applied to solder bump processes. This is a matter of an intended use and the apparatus of Tseng et al is inherently capable of being used for this purpose.

Regarding claim 41: The apparatus of Tseng et al, said means for pre-filtering comprising control valves, said control valves being controlled in an inter-dependent manner. The figures of Tseng et al illustrate this.

Regarding claim 42: The apparatus of Tseng et al, wherein said control valves are applied for purposes of maintenance and of flow bypass of dry film removal solution and for normal return of dry film removal solution, this is a matter of an intended use and the apparatus of Tseng et al is inherently capable of fulfilling this purpose.

Regarding claim 43: The apparatus of claim 24, wherein said dry film solution is not replaced

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during said pre-filtering. This is a matter of an intended use and the apparatus of Tseng et al is inherently capable of being used for this purpose. Note that this limitation also does not require any additional structural limitation.

Regarding claim 44: The apparatus of Tseng et al, wherein said dry film solution is replaced during said pre-filtering, resulting in improving effectiveness in removing dry film from the dry film solution, line 86 performs this function.

Regarding claim 45: The apparatus of claim 24, said means for pre-filtering comprising at least one trap for filtering of said dry film removal solution, said trap comprising a structure having square or rectangular sides.

Regarding claim 47: An apparatus for removing dry-film contaminants from a dry-film solution, comprising:

first applying a dry film removal solution to a semiconductor wafer to remove a dry-film from the semiconductor wafer, said dry film removal solution containing dry film;

circulating said dry-film removal solution; collecting said circulated dry-film removal solution',

pre-filtering said dry-film removal solution, thereby removing said dry-film from said collected dry-film removal solution; and second applying a dry film removal solution to said at least one semiconductor wafer.

See the rejection of claim 24.

Regarding 48. The apparatus of claim 47, wherein said circulating said dry film removal solution comprises providing means for circulating said dry film removal solution from said first applying to said collecting to said pre-filtering to said

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second applying a dry film removal solution, further providing at least one fluid control valve with interconnecting tubing for flow of dry-film removal solution there-through and at least one pump for propulsion of dry film removal solution there-through. See the rejection of claim 25.

Regarding claim 49: The apparatus of claim 47, said pre-filtering being intermittently applied with time-periods between successive applications, assuring that the pre-filtering is not at all times part of a dry-film removal circulation loop, see the rejection of claim 26.

Regarding claim 50: The apparatus of claim 47, whereby by-products of the dry film pre-filtering from the dry-film removal solution will be dissolved and returned to the solution. See the rejection of claim 27.

Regarding claim 51: The apparatus of claim 50, whereby said dissolving and returning to the solution of said by products is dependent on the time of operation of the means for dry-film pre-filtering. See the rejection of claim 28.

Regarding claim 52. (Original) The apparatus of claim 47, said pre-filtering comprising valves and a pre-filter module. See the rejection of claim 29.

Regarding claim 53. (Original) The apparatus of claim 52, said valves and a pre-filter module comprising control capabilities such that said valves and pre-filter module can be adjusted as a function of the time of operation of the means for pre-filtering.

Regarding claim 55. (Original) The apparatus of claim 47, whereby by-products that are pre-filtered are not returned to the dry film removal solution. See the rejection of claim 32.

Regarding 56: The apparatus of claim 47, further comprising circulation of the dry film removal solution by closing a pre-filter valve, see the rejection of claim 33.

Regarding 57: The apparatus of claim 47, whereby effectiveness of said means for pre-

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filtering is dependent on a Stripping Rate and Trapping Rate of the dry-film removal solution.

This is an intended use limitation wherein the apparatus of Tseng et al is inherently capable of performing this function.

Regarding claim 61: The apparatus of claim 47, wherein an optimum operational temperature is established with as objective of achieving an optimum Stripping Rate. This is an intended use limitation wherein the apparatus of Tseng et al is inherently capable of performing this function.

Regarding claim 62: The apparatus of claim 47, whereby said pre-filtering is preferably applied to solder bump processes. This is a matter of an intended use and the apparatus of Tseng et al is inherently capable of being used for this purpose.

Regarding claim 64: The apparatus of claim 47, said pre-filtering comprising control valves, said control valves being controlled in an inter-dependent manner. See the rejection of claim 41.

Regarding claim 65: The apparatus of claim 64, wherein said control valves are applied for purposes of maintenance and of flow by-pass of dry-film removal solution and for normal return of dry-film removal solution. See the rejection of claim 42.

Regarding claim 66: The apparatus of claim 47, wherein said dry-film solution is not replaced during said pre-filtering. See the rejection of claim 43.

Regarding claim 67: The apparatus of claim 47, wherein said dry film solution is replaced during said pre-filtering, resulting in improving effectiveness in removing dry film from the dry film solution, see the rejection of claim 44.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 31, 46, 54, 58, 60, 68, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng et al in view of Kitajima et al (US 6,828,883).

The teachings of Tseng et al were discussed above.

Tseng et al fails to teach filter comprising traps.

Kitajima et al teaches a trap filter and designing it with optimal height and throughput, see abstract. The filter is in the shape of a square and comprises a plurality of traps. Though Kitajima et al fails to teach the specific dimensions claimed in the present invention, In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to design a filter comprising traps with the optimal dimensions and shape to screen the particles to enhance the recirculated solution supply.

7. Claims 36, 40, 59, 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng et al in view of Sasaki et al (US 6,828,883).

The teachings of Tseng et al were discussed above.

Tseng et al fails to teach the removal solution comprises DMSO with TMAM. However, Sasaki et al teaches that DMSO is a known suitable solvent for dissolving surface treatment agents. The composition of a solution is an optimizable processing parameter. Thus, it would have been obvious for one ordinary skill in the art at the time of the claimed invention to provide a solution with the claimed composition the stated composition provides optimal dry film removal.

Regarding claims 40 and 63: Both Tseng et al and Sasaki et al are silent to the flow rates of their solutions. However, the flow rate of a solution in a process is a known optimizable processing parameter. It would have been obvious for one of ordinary skill in the art at the time of the claimed invention to optimize the flow rate of the solution to provide efficient flow through the process and an enhanced throughput.

8. Claims 37 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng et al in view of Furukawa (US 6,656,321).

The teachings of Tseng et al were discussed above.

Tseng et al fails to teach that the operational temperature of the filter is constant.


Furukawa et al teaches a liquid processing apparatus using a temperature regulator 65 see col. 7 lines 15-22. This temperature regulator is used to maintain the temperature of the fluid and is located prior to the filter see Fig. 8. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Tseng et al and Furukawa to enhance process control.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the core hours of 9 a.m. and 3 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sylvia R MacArthur
Patent Examiner
Art Unit 1763

August 1, 2005